

A STUDY OF THE STRUCTURE AND EROSION OF BRUSH MOUNTAIN, IN BLAIR COUNTY, PENNSYLVANIA (WITH A MAP).

BY J. P. LESLEY,

*Professor of Geology in the University of Pennsylvania.*

At one of the meetings of the Society in the summer of 1873, a proof copy of the Map of Brush mountain, bound into this number of the Proceedings, was exhibited to the members, and its most interesting features pointed out.

No detailed description of it seems necessary. Those who are conversant with Topography in its application to Geology will find sufficiently plain indications of the state of things at the Tyrone City Gap and along the Little Juniata River, displayed by the ten-foot contour-lines of the topography, and by the three small vertical sections placed near the geographical points where they were made.

The system of thick and thin contour-lines on the dark and light sides of hills, to bring them into relief, is one which I invented about the year 1855, using it on a large scale for the first time in the construction of my elaborate Maps of Fayette and Westmoreland Counties, made for the Pennsylvania Railroad Company. The effect upon the portraiture of five hundred square miles of that strongly accidented country was very fine ; and was obtained without in any measure sacrificing the scientific accuracy of the work. I have pursued the same plan ever since, and teach it in the Geological laboratory of the Scientific Department of the University.

The Map here given is a heliotype reduction to one-third (linear) of the original drawing, made by James Osgood & Co., of Boston. It is therefore a fac simile ; and every error is exhibited. The only one needing designation is of a grave character, and I hope to present a correction of it at some future time. The narrow, straight and deep little valley which heads southwest between the crests of the mountain, and issues northeast at the centre of the Gap, is not straight at its mouth. It bends down stream somewhat, allowing the southeast shoulder of the northwestern ridge to project into the Gap, in the same style as does the southeast crest ridge on the opposite side of the Gap ; only in a reverse direction ; that is, down stream instead of up stream. This may be considered a venial error of detail, but it is not ; for it casts a shadow on the demonstration that the erosion of any one part of Apalachian land-surface relates itself harmoniously with the general erosion of its district ; and yet is differentiated by exceptional parts of structure. The short ravine splitting the mountain on the northeast side of the Gap would have bent southward at its mouth, like the long ravine opposite to it, but for a crush in the red rocks of IV., caused

by the same force which has thrown the whole mountain on that side of the river forward (northwestward) about two hundred yards.

This upthrow fault, plainly exhibited by the Map, has undoubtedly determined the point at which the drainage of the Upper Little Juniata River had to pass the outcrop barrier of the vertical measures of IV (Middle Silurian) now constituting the double crested mountain, called Brush Mountain northwest of the Gap, and Bald Eagle Mountain northeast of the Gap.

There are similar faults connected with the issuing points of the Little Juniata and of the main Juniata at their gaps through Tussey Mountain, which forms the descending (S. E.) outcrop of the same measures on the other side of the great anticlinal, ten miles further to the southeast.